

Constellation-X Facility Science Team Meeting (FST) — Nov. 19/20, 2003

Constellation

The Constellation X-ray Mission



▶▶ Project Status and Update

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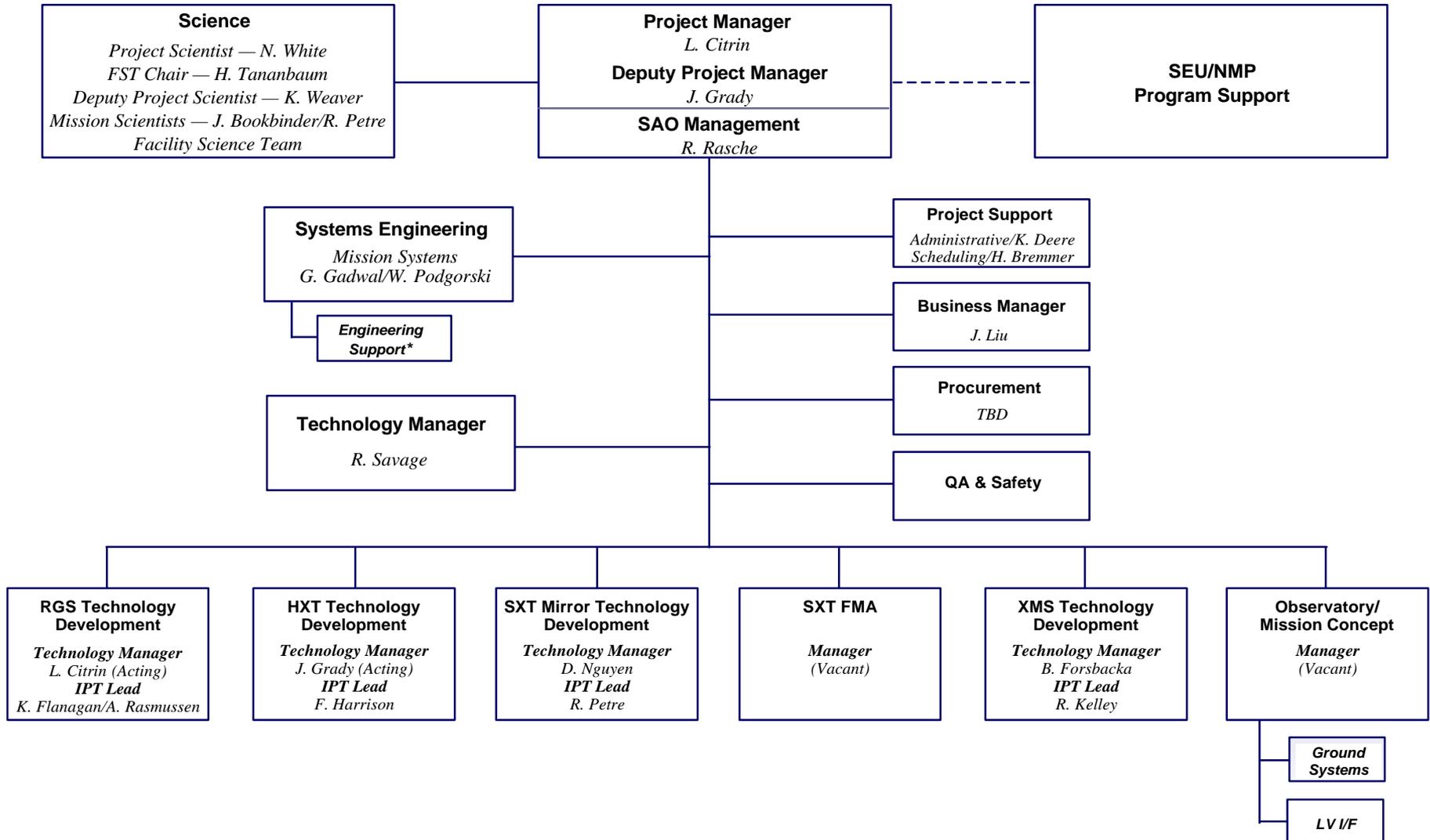
NASA Safety and Mission Success Week—November 17-21, 2003

- How is the Columbia Accident Investigation Board (CAIB) report relevant to the Constellation-X Project?
- Some “organizational causes” are more relevant to Phase C/D, but should be considered in our planning
 - Engineering and safety compromises
 - Mischaracterization of unexpected performance
 - Reliance on past success instead of sound engineering
- Some factors should be addressed now
 - Organizational barriers to effective communication
 - Lack of opportunity to express minority opinions
 - Lack of integrated management across program elements
 - Informal chain of command

Highlights of Last Year (FY03)

- **Technology Readiness and Implementation Plan (TRIP) baseline developed—a solid technical and programmatic baseline**
- **Beyond Einstein Initiative included in the President's budget**
 - Con-X (and LISA) directed to move into Phase A
 - Project re-phased per HQ guidelines—launches in 2013 and 2014
- **Organization strengthened**
 - Strong technical leadership additions (Kathy Flanagan and Paul Reid)
 - Project organization evolving to reflect move to Phase A
- **Technology management process developed**
 - Incorporates Project-sponsored independent/peer reviews to assess technology readiness
- **Kicked off SXT FMA industry studies procurement**
- **Significant progress in all technology development areas**

Constellation-X Formulation Organization

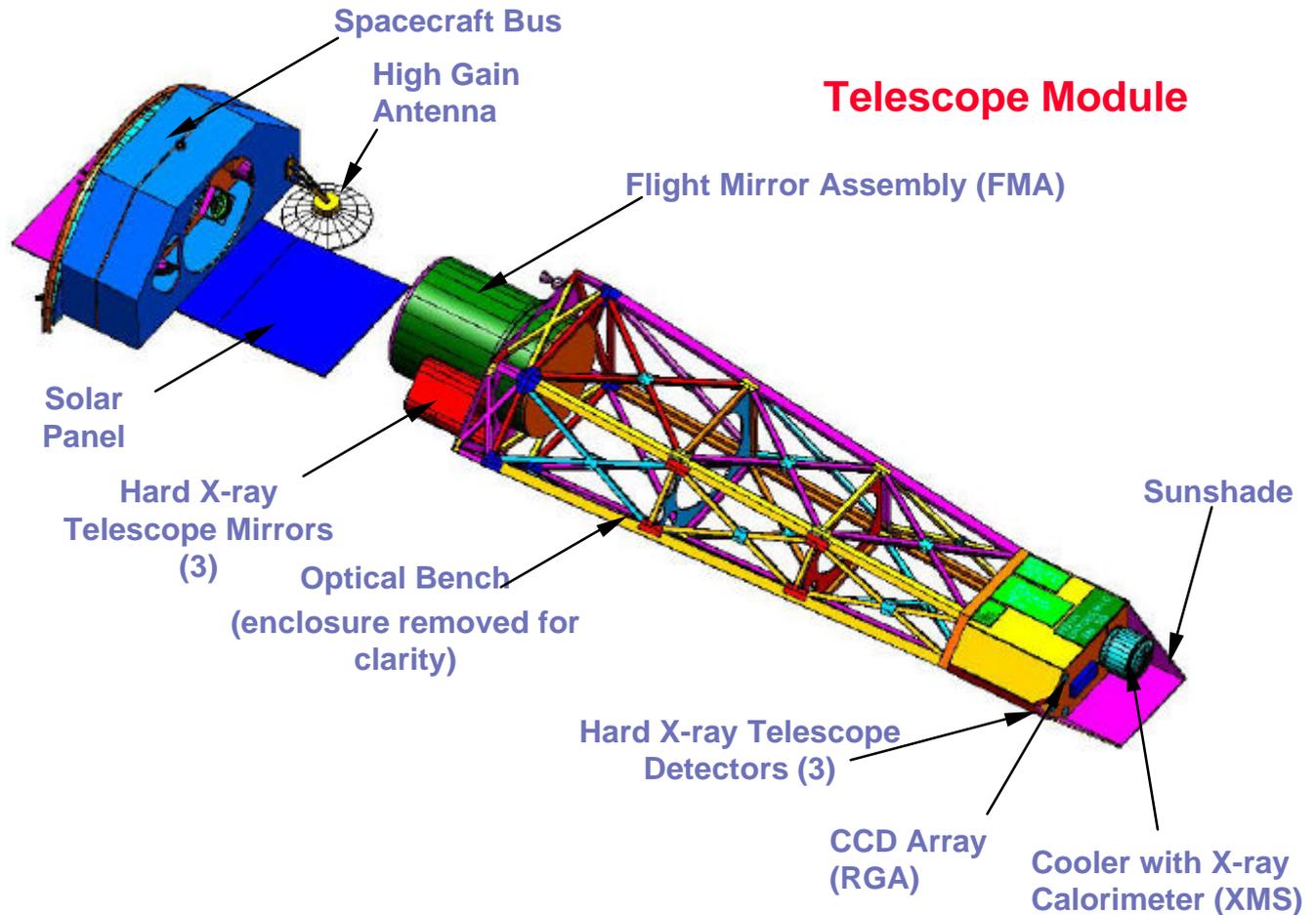
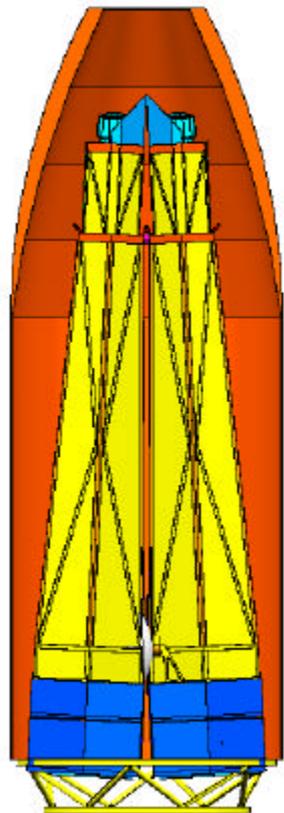


*Engineering Support: Mechanical, Thermal, Electrical, C&DH, Communications, Propulsion, Guidance, Navigation & Control, Flight Dynamics, Cryo-Systems

Mission Reference Configuration

Spacecraft Bus

Telescope Module

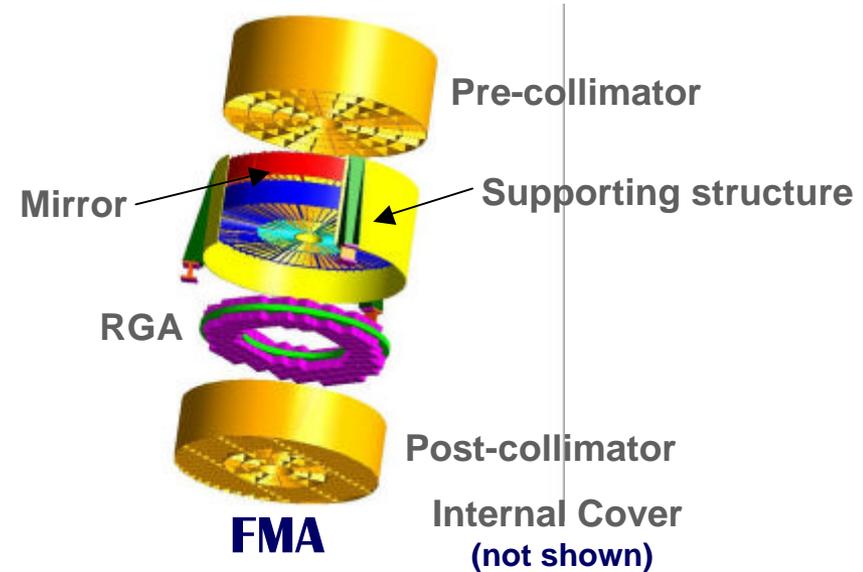


Launch Configuration

Scope of FMA for this Study

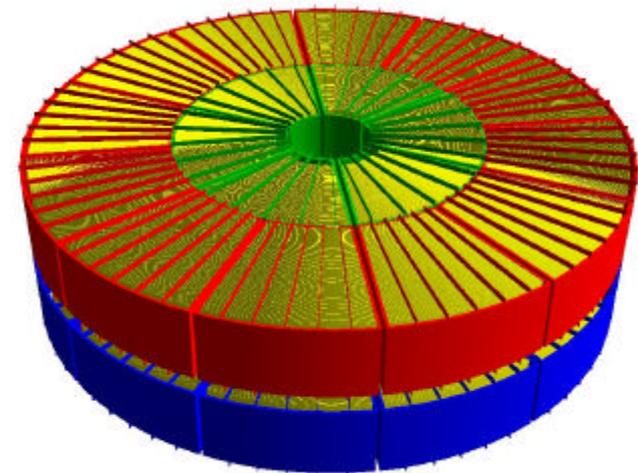
- “FMA” includes:

- Mirror
- Reflection Grating Spectrometer (RGS) Grating Array (RGA)
- Collimators (Pre- and Post-)
- Internal Cover
- Supporting structure



- “Mirror” includes:

- Reflectors
 - Primary and Secondary
 - Properties Constrained under FMA Requirements Documents
- Structural Support and Alignment for Reflectors



Mirror

Objectives of FMA System Study Contract

- **Begin FMA technology and systems knowledge transfer to potential industry FMA providers**
- **Develop an FMA design**
- **Provide input to and feed back on specifications at various levels**
 - Technology development program specifications
 - Preliminary production specifications for Reflector Production Study contract
 - Reflection Grating Spectrometer interfaces
 - Observatory level specifications
- **Develop strategies for FMA technology transfer**
- **Identify final stage(s) of FMA prototype**
- **Provide input in preparation for FMA flight procurement**
 - Requirements and Interface definition
 - Cost and schedule ROM's

Scope of FMA Systems Study

- **Work included in this study**
 - Assessment of FMA Reference Concept
 - Development of FMA Contractor Study Design
 - Development of Preliminary Flows for FMA Manufacturing, Integration and Test consistent with Contractor Study Design
 - Define FMA Prototype Unit consistent with Study Design
 - Development of Preliminary Cost and Schedules for Study Design
- **Work not included in this study**
 - Technology hardware development or demonstration
 - Study of mandrel production
 - Study of reflector production
 - Study or analysis relating to anything internal to grating modules such as grating alignment or mounting within modules

FY04 Planning Highlights

- **Move into Phase A**
 - Begin to put some formal management processes into place (risk management, requirements management, configuration management)
 - Continue building up the Project organization—add key management and engineering support
- **Bring on industry partners through the SXT FMA industry studies contracts**
- **Begin preparations for mission-level study contracts**
- **Begin planning for instrumentation Annoucements of Opportunity**
- **Progress in each of the technology development areas**
 - Also, will institute a more rigorous technology assessment process
- **Although some FY04 re-planning will likely be necessary, these activities are essential and within anticipated funding levels**